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X-Ray Absorption Spectroscopy of Metallo-Imprinted Polymer Hosts

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ABSTRACT: We have been performing X-ray absorption studies on the polymers containing imprinted with cobalt or iron binding sites, many of which mimic the coordination sites of metalloenzymes and oxygen-binding proteins. The template polymerization technique (using kinetically inert cobalt(III) complexes) allows for the synthesis of new metal complexes that can not be formed by solution techniques. EXAFS has proved to be a valuable tool in confirming that the metal sites in the imprinted polymers have the expected coordination geometry. The EXAFS analysis has, for instance, enabled us to prove that the cobalt atoms in imprinted polymers are directly binding to NO molecules in a manner similar to that seen in monomeric cobalt complexes. This information is useful in our attempts to produce novel materials useful for biomedical applications such as NO sensors and slow-release NO delivery agents.